1431

DCR STATUS LOG FEBRUARY 11, 1991

02/11/91

82
ENCLOSURE

DCR STATUS LOG
February 11, 1991

DCR #	QAPP Required	Change Revised	Impacts
7	Temporary well casing to be 10" for all wells.	Due to excess friction from drilling, the change resulted in the use of 10" temporary casing to a depth of 175' and 8" temporary casing thereafter on all 4000-series wells	There is no impact on the analytical results from the well samples. However, strict adherence to the QAPP requirement could invalidate 3 wells installed using this technique.
8	Wording on frequency for analyzing final deionized water rise was unclear. Stated as "one per every set of twenty samples or fraction thereof to check for cross-contamination."	Clarified the frequency of rinsate collection. Rinsates are to be collected "at a frequency of one per every set of twenty locations or, fraction thereof, to check for cross contamination." This represents a reduction in rinsate collection for soil boring samples. Rinsate samples are now collected once per 20 borings as opposed to once per 20 subsurface soil samples	No impact on groundwater, surface water, sediments, and surface soils since the practice did not change. Rejection of this change would invalidate all subsurface soil collected in the facilities testing program.
11	Only four laboratories were identified in the QAPP; RSL-OR, Mixed Waste Lab - OR, Middlebrook Pike Lab - Knoxville and Export Lab - Pittsburgh.	Six additional IT laboratories were added to reduce missed hold times experienced by the project. Additionally, Santa Clara, Special Analysis Lab, and Edison added previously unavailable organo-phosphates, dioxins, and biological analytical capability, respectively. Revised laboratory qualifications to include analyses of US EPA CLP Performance Evaluation samples or US EPA Cross-Check Program samples for radiological labs.	Failure to accept the use of these labs will invalidate all analysis from these labs and leave the project with no laboratories for organo-phosphate, biological and dioxin analyses.

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DCR STATUS LOG
February 11, 1991

DCR #	QAPP Required	Change Revised	Impacts
12	Revised the Water Quality Field Collection Report form to exclude a location sketch and date received by lab and recipient of the sample. Also deleted redox and zobel measurements which were not required by the Work Plan.	The water collection form was changed to reflect the actual field requirements or capabilities. Previous form identified sample management requirements provided in other forms such as the Chain-of-Custody and Request for Analysis forms. The sketch requirement was incorporated into project well maps. Additions to the form included equipment identification and checks performed by the field personnel.	No significant impact. The required information was unavailable from other sources.
15	Identified only a positive gas displacement, stainless steel or teflon bladder pump or teflon bailer for use in sample collection.	Provided for use of a stainless steel purge pump for purging the well and collection of all, but TOC, TOX or VOA samples.	No technical impact. The use of a centrifugal purge pump for collect of radiological, semi-volatiles and inorganic samples is appropriate. The project has historically used a teflon bailer for collection of TOC, TOX and VOA samples. However, strict adherence to the unmodified QAPP would invalidate all but the TOC, TOX and VOA analysis.
17	Formula required determinations of field permeability tests to be determined from cased hole, soil flush with bottom casing, disregarding the presence of a screened interval.	Corrected the definition and formula to be used to determine the screen length for cased or uncased wells on Figure 5-18, Field Permeability Tests Form.	Correction is essential to obtaining correct information. The correction of the field form is consistent to the textual requirements of the QAPP.

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DCR STATUS LOG
February 11, 1991

DCR #	QAPP Required	Change Revised	Impacts
20	IT Audit procedures were identified in Section 12.0 for project use.	Provided for the use of ASI Audit Procedures for audits performed by the contractor.	No significant technical impact from this change. No reduction of the QA audit function was involved in the change.
23	Wells were identified using a 3-digit identifier.	Well identification was changed to a 4-digit system.	No technical impact. But reversing to the old system would require total revision of all project documentation including hundreds of drawings.
25	No reference to field testing for alkalinity and record potential.	Added the analysis procedures for alkalinity and redox potential to the QAPP as part of field analysis for groundwater.	This formalized the program in use and corrected the oversite of not including a field procedure initially.
26	Calibration of the FIDLER radiation detection instrument consisted of a 5 minute count of a standard with comparison to a control chart constructed at the beginning of field activities. Correlation of the Large-Volume Scintillation Detector was performed weekly.	The methodology used to prepare the FIDLER control chart was revised to provide a more appropriate statistical basis of comparison. Large Volume Scintillation Detector correlation checks were plotted every measurement rather than weekly.	There are no significant technical impacts from these changes.

DCR STATUS LOG
February 11, 1991

DCR #	QAPP Required	Change Revised	Impacts
28	Section 15.0 provided a general written description for document control for project documents.	This DCR institutes a program of document and drawing approval including a methodology for rapid identification to the QAPP and other volumes of the Work Plan. A formal program to authorize and track variances to approved procedure was established. The Document Change Request procedure was expanded to allow tracking by the RI/FS QA Officer.	No technical impact. Administrative impact on documents being reviewed or that have been reviewed. Systems setup to handle DCR will not have a structured work flow.
45	Only allowed the use of 10" temporary casing or telescoping as per DCR #7.	Authorized the use of 8" temporary casing due to the lack of available 10" temporary casing for wells. Changed technical specification but did not affect sampling or analysis requirements.	EPA approved in TIE. Disapproval of this change would invalidate the construction method of well 4011 and 3032.
49	Identified calibration for Health and Safety equipment on a three month cycle.	Changed Health and Safety Instrument Calibration from three month frequency to six months. This change was based on a manufacturer's recommendation of annual calibration of these instruments.	This allowed a reduction in lost time due to equipment not being available and an equipment maintenance cost reduction.

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PAGE 1 OF 2 DP 10/1/88

RI/FS
DOCUMENT CHANGE REQUEST

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SAFETY INVOLVED	YES	NO
	☐	☒

REQUEST NO: 7

Completed by: _____
Revision/
Issue Date: _____

DO NOT WRITE IN THIS BLOCK

REQUESTOR Lowell Wille PHONE NO.: 738-3100 DATE April 26, 1988

DOCUMENT TITLE QAPP, Revision 3 DOCUMENT NUMBER n/a

SECTION/PARAGRAPH/PAGE NO.: Section 5.2, page 24 of 70 (last paragraph) and Fig. 5-15

ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

There are currently three to seven 400-series monitoring wells scheduled to be installed for the off-site program. The maximum anticipated depth to bedrock at one of the defined 400-series monitoring wells to be installed is 220 feet below ground surface. Based on previous experience with 300-series monitoring wells drilled on-site, the maximum depth that 10-inch ID. temporary casing can be driven and pulled is about 175 feet. This depth will vary depending on site conditions. Telescoping the 10-inch ID, temporary casing to 8-inch ID, temporary casing will make it easier to drive and pull temporary casing in the deeper 400-series wells, and speed up the drilling operation. The amount of sand pack material surrounding the monitoring well screen will be reduced but this should not adversely effect the efficiency of the monitoring well or the quality of the ground water sample.

WILL DP 11/09/88

CONTENT OF CHANGE

See Figure 5-15, Summary of Specifications for Well Completion 300- and 400-Series Wells

- When advancing the boring using cable tool drilling techniques, a temporary steel casing will be drilled, driven, or pushed as the borehole is advanced. The temporary casing will be nominal ten-inch diameter to allow for construction of the monitoring well in the 100, 200, and 300 series borings. The temporary casing in the 400 series borings will be nominal ten-inch diameter to approximately 150 foot depth, then telescope to nominal eight-inch diameter to allow for the construction of the monitoring well. Cuttings will be removed from the borehole using a sand pump or dart valve bailer.

CANCELLATION INSTRUCTIONS N/A

CANCEL DOCUMENT NO.: _____

Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 5-7-88	Denny J Carr 12-15-88
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
8-31-88	12-20-88
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
8/31/88	H.E. Richardson 12/15/88
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
Timothy Ellenby 5/6/88	Mary E. Hon 1/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ____
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

- After the walkover of the grid is completed, the scaler and timer are stopped and the following items are recorded on the Surface Measurements Field Logbook Form (Figure 5-3): (1) grid ID number, (2) the total count, and (3) the elapsed time.

- Return to each location which has been "flagged" within the grid and perform a systematic survey beginning at the flag and working outward to determine the areal extent of the elevated reading.

- Record the highest count rate and the approximate location and areal extent; insert a marker at the location of highest reading.

5.2 DRILLING PROCEDURES

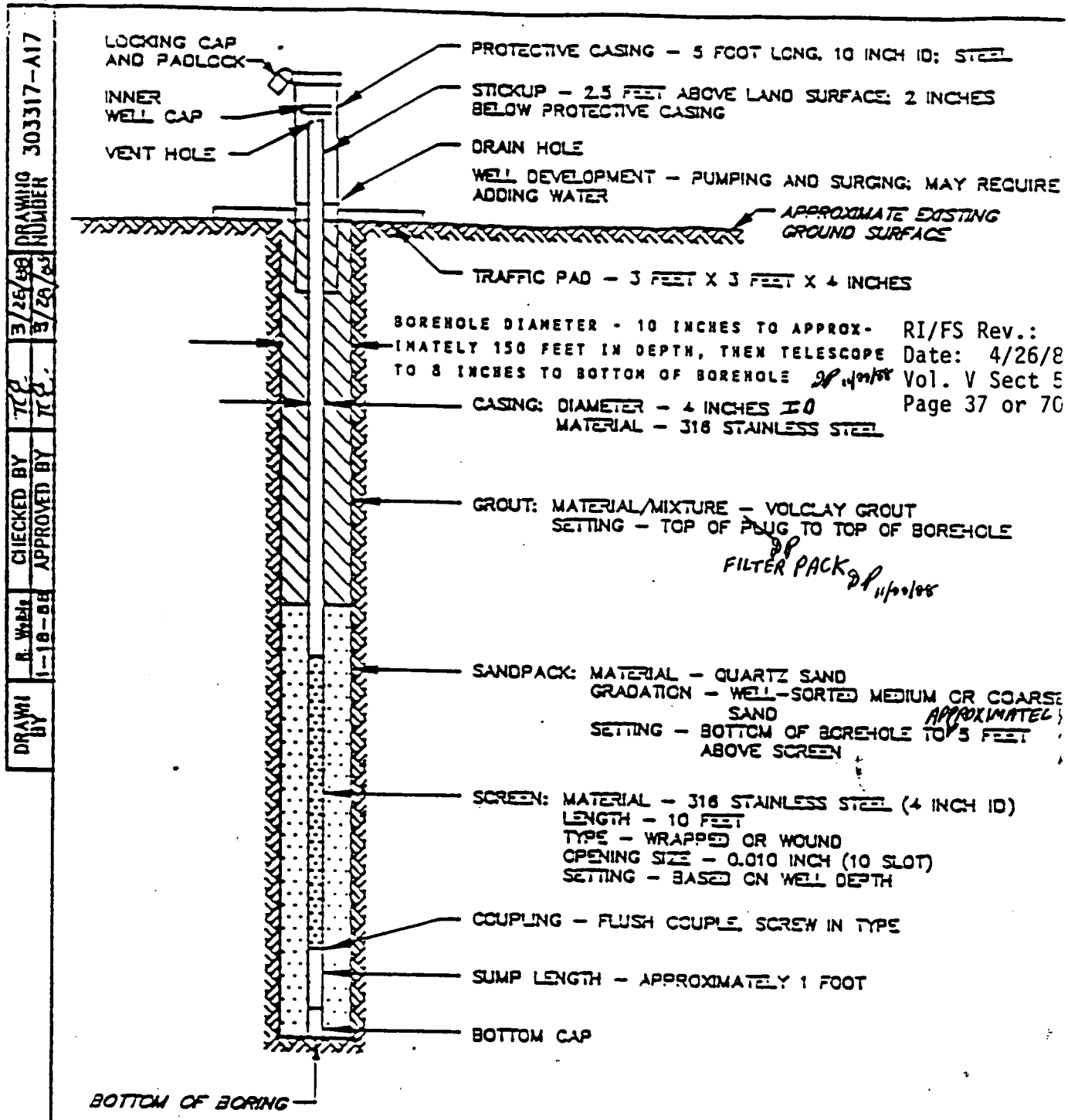
Soil borings are made to determine the nature, arrangement, thickness and extent of the soil strata. The depth of borings, frequency, and the type of testing and sampling required are dependent upon the purpose of the subsurface investigation.

Borehole advancement for monitoring wells will be performed using cable tool drilling techniques. The use of mud rotary or continuous flight hollow stem augers is prohibited for monitoring wells. A soil auger drilling rig will be used to collect undisturbed soil samples in clay layers that may be found in the till. With the cable tool techniques, the hammer is used to dislodge the soils and mix them with potable water for recovery and removal from the hole. Cable tool borehole drilling will be performed in accordance with Section 2.2.5, Percussion Drilling Borehole Advancement, IT Manual of Practice, Subsurface Investigations.

Comments from the IT Manual of Practice, Subsurface Investigations pertinent to the cable tool drilling technique follow:

- When advancing the boring using cable tool drilling techniques, a temporary steel casing will be drilled, driven,

or pushed as the borehole is advanced. The temporary casing will be nominal ten-inch diameter to allow for construction of the monitoring well in the 100, 200, and 300 series borings. The temporary casing in the 400 series boring will be nominal ten-inch diameter to approximately 150 foot depth, then telescope to nominal eight-inch diameter to allow for the construction of the monitoring well. Cuttings will be removed from the borehole using a sand pump or dart valve bailer.



RI/FS Rev.:
Date: 4/26/8
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Page 37 or 70

"NOT TO SCALE"

FIGURE 5–15

SUMMARY OF SPECIFICATIONS FOR WELL COMPLETION
300– AND 400– SERIES WELLS

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PAGE 1 OF 6 2d 12/1/88

RI/FS
DOCUMENT CHANGE REQUEST

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SAFETY INVOLVED	
YES ☐	NO ☒

REQUEST NO:	8
Completed by:	
Revision/ Issue Date:	
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REQUESTOR Timothy L. Ellenberger PHONE NO.: 738-3100 DATE May 12, 1988

DOCUMENT TITLE QAPP DOCUMENT NUMBER N/A

SECTION/PARAGRAPH/PAGE NO.: Section 6.0/Page Nos. 8, 22, 24, and 26 of 59

ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

Rinsate sample collection with a frequency of one per every twenty locations, or fraction thereof, to be sampled to spot check for possible cross contamination will be sufficient.

This is an increase in sample frequency.

ARC 12/20/88

CONTENT OF CHANGE

- Section 6.1, Ground Water Sampling Techniques; change on page 8 of 59.
- Section 6.4, Surface Soil Sampling; change on page 22 of 59.
- Section 6.5, Sediment Sampling; change on page 24 of 59.
- Section 6.6, Subsurface Soil Sampling; change on page 26 of 59.

SEE ATTACHED.

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: N/A

Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 6-8-88	Dennis J. Carr 12-15-88
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
8-31-88	12/20/88
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
Robert M Gallagher 6/31/88	H.E. Richardson 12/15/88
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
Timothy C Ellenberger 5-17-88	Mary E Howe 1/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓

B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ____

C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

- When the pump and lines are removed from a well, they will be placed on plastic sheeting to avoid contact with the ground.

- Prior to re-use, the pump and lines will be drained and the outside surfaces will be decontaminated with a water wash and deionized water rinse. The internal surfaces will be decontaminated by pumping deionized water through the pump system. Purging of the next monitoring well will further reduce the possibility of cross-contamination. Should the equipment become visibly contaminated, it will be disassembled and cleaned by the following procedures:

  - In the case of inorganic contaminants, the equipment will first be washed with a nonphosphate detergent and then rinsed with dilute (0.1 N) hydrochloric acid followed by two separate deionized water rinses.

  - In the case of organic contaminants, the equipment will first be washed with a nonphosphate detergent and then rinsed with tap water, methanol, and two separate deionized water rinses.

  - As described above, the equipment will be thoroughly rinsed with two deionized water rinses to remove traces of hydrochloric acid, detergent, and methanol (acetone may be substituted for methanol if volatile organic compounds are not being determined).

  - Sampling equipment will not be placed directly on the ground or on other contaminated surfaces prior to insertion into the well, but will be placed on a clean plastic sheet adjacent to or around the well.

  - The final deionized water rinse will be sampled and analyzed at a frequency of one per every set of twenty locations, or fraction thereof, to check for cross-contamination between monitoring wells.

  - Decontamination of the submersible sampling pump(s) and other sampling equipment will be performed at a designated central staging area at the FMPC. If this is not possible due to extenuating circumstances, the sampling equipment may be decontaminated in the field.

- Existing wells with limited access will be sampled from the pump discharge.

- Make sure samples are properly labeled and chain-of-custody records, sample collection logs, water quality field collection reports (Figure 6-1), and laboratory request for analysis forms are properly filled out.

6.4 Surface Soil Sampling

Surface material or soil will be collected using a hand trowel, scoop, or coring device in accordance with the Work Plan and the Surface Soil Sampling Task Procedures. The following procedures will be used for soil sampling:

- Samples will be collected using a trowel, scoop, or coring device in accordance with the sampling plan.

- Decontamination of all sampling equipment will be performed at a designated central staging area at the FMPC. Decontamination in the field will only be performed if circumstances prevent equipment decontamination at the staging area. The trowel, scoop, or coring device, and other sampling equipment such as pans, gloves, etc. will be decontaminated between each sample collection by cleaning with a nonphosphate detergent and a bottle brush, rinsing with tap water, methanol (acetone may be substituted if volatile organic compounds are not being determined), and two separate deionized water rinses.

- The final deionized water rinse following equipment decontamination will be sampled and analyzed at a frequency of one per every set of twenty locations or fraction thereof to check for potential cross-contamination between surface soil sample locations.

- Sufficient sample and rinsate volumes will be collected to perform all required analyses.

- Samples will be transferred directly from the hand trowel, scoop, or coring device to the appropriate sample containers.

- If soil samples are being collected for volatile organics analysis (VOA), the sample must be transferred to standard VOA vials. Vials should be completely filled to minimize any head space in the containers.

- Soil samples collected for other organic or inorganic analyses should be transferred to glass containers with screw cap closures.

- A field/trip blank for each sample set will accompany the samples back to the laboratory. The field/trip blank will consist of organic-free deionized water used in the field to decontaminate the sampling equipment.

- Sampling equipment will not be placed directly on the ground or other contaminated surfaces prior to use, but will be placed on a clean plastic sheet.

- Samples of the final deionized water rinse will be collected and analyzed at a frequency of one per every set of twenty locations or fraction thereof to check for cross-contamination between sampling points.

Decontamination of the sampling equipment will be performed at a designated central staging area at the FMPC. If this is not possible due to extenuating circumstances, the sampling equipment may be decontaminated in the field, but only as a last resort.

- o A sufficient amount of samples will be collected to perform all required analyses.

- o Samples will be transferred directly to a stainless steel pan for thorough mixing of the sample prior to transfer to the proper sample container.

- o Collected samples will be stored in the field in an ice chest filled with commercially available icing material and maintained at approximately 4 degrees Celsius.

- o Samples will be properly labeled and chain-of-custody records, field collection reports, and laboratory request for analysis forms will be properly completed.

6.6 SUBSURFACE SOIL SAMPLING

6.6.1 COLLECTION OF SUBSURFACE SOIL SAMPLES

Subsurface material or soil will be collected using a split-spoon sampler or thin-wall tube in accordance with the Work Plan. Once collected, sampling equipment will be decontaminated and samples will be transferred to appropriate containers (see Section 6.4).

Subsurface materials or soils will be collected from soil borings. The borings will be advanced using cable tool drilling for monitoring wells and a soil auger drill rig for geotechnical and geochemical borings. Other suitable means may be used for the geotechnical borings depending on the characteristics of the

- Subsurface soil samples collected for other organic or inorganic analyses should be transferred to glass containers with screw cap lids.

- Samples to be tested for physical characteristics requiring undisturbed soil should not be transferred but should be left in the Shelby tube. The ends of the Shelby tube are capped, taped, and sealed with wax.

- A sample label, chain-of-custody form, field collection report, and a laboratory request for analysis form will be filled out in the field.

- The split-spoon sampler and other sampling equipment such as trowels, pans, gloves, etc. will be decontaminated between each collected sample by cleaning with tap water and a bottle brush, rinsing with deionized water, methanol, and deionized water again. Should the sampling equipment become heavily contaminated, it will be cleaned according to the following procedures:

  - In the case of inorganic contaminants, the equipment will first be washed with a nonphosphate detergent and then with dilute (0.1 N) hydrochloric acid, followed by two separate deionized water rinses.

  - In the case of organic contaminants, the equipment will first be washed with a nonphosphate detergent and then rinsed with tap water, methanol, and two separate deionized water rinses.

  - As described above, the equipment will be thoroughly rinsed with two deionized water rinses to remove traces of hydrochloric acid, detergent, and methanol (acetone may be substituted for methanol if volatile organic compounds are not being determined).

  - Sampling equipment will not be placed directly on the ground or other contaminated surfaces prior to insertion into the boring, but will be placed on a clean plastic sheet adjacent to or around the boring.

  - Samples of the final deionized water rinse will be collected in sample bottles containing the appropriate preservatives and analyzed at a frequency of one per set of twenty locations or fraction thereof to check for cross-contamination between borings.

ORIGINAL

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SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO: 11
Completed by: _____ Revision/ Issue Date: _____
DO NOT WRITE IN THIS BLOCK

REQUESTOR Timothy L. Ellenberger PHONE NO.: 738-3100 DATE Sept. 15, 1988
DOCUMENT TITLE QAPP, Revision 3 DOCUMENT NUMBER N/A
SECTION/PARAGRAPH/PAGE NO.: 4.1/ 1 of 23; 4.2/2-4 of 23; 8.0/1-3 of 12; 9.0/1 of 67; 2.0/1 o
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

See Attachment 1.

CONTENT OF CHANGE

DB 10/6/88

See ~~Attachment~~ 2.

QAPP VOL. V

SECTION	PAGE
4.0	1 of 23
4.0	3 of 23
8.0	1 of 12
8.0	3 of 12
9.0	1 of 67
2.0	1 of 3

CANCELLATION INSTRUCTIONS
CANCEL DOCUMENT NO.: N/A
Reason for cancellation:

REQUIRED APPROVALS

RT Wille 10-1-88	N/A MER 1/25/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
11-7-88	N/A MER 1/25/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
10/10/88	H.E. Richardson 1/25/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
Timothy C Ellenberg 20 Sept 88	Mary E Bone 2/27/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ✓
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

ATTACHMENT 1

JUSTIFICATION

The following ten IT laboratories, which are (1) CLP-certified (presently have a U.S. EPA contract), (2) participate in CLP (presently analyze Performance Evaluation Samples), or (3) participate in the U.S. EPA Cross-Check Program (radiological laboratories only), will be used to analyze FMPC samples. All samples for radiological analysis will be sent to RSL. All samples for chemical analysis (except for dioxins and organophosphorus pesticides) will be analyzed at the Mixed Waste Laboratory. When excessive numbers of samples with short holding times arrive at the Mixed Waste Laboratory, samples will be forwarded to chemical laboratories with available capacity. The additional laboratories for chemical analysis are: Middlebrook Pike, Export, Cerritos, Austin, and PEI. The laboratory for acute and chronic analysis is Edison. Dioxins will be analyzed at the Special Analysis Laboratory, and organophosphorus pesticides will be analyzed at the Santa Clara Laboratory.

CLP data packages will be provided for all samples analyzed by the HSL program as defined by the Sampling Plan. CLP includes HSL volatile and semi-volatile organics, HSL inorganics including cyanide and HSL pesticides/PCBs. The parameters that are not on the HSL will not have a CLP data package. The following chemical analysis is defined in the Sampling Plan, Revision 3:

- **Surface Soils Sampling Plan, Section 2.0, page 11 of 11.**

  Soil samples designated for chemical analysis will be analyzed for the following extended HSL parameters for which analytical methods are presented in Section 9.4 of the QAPP.

  - HSL Inorganics
  - HSL Volatiles
  - HSL Semi-volatiles
  - HSL Pesticides/PCBs
  - Primary Drinking Water Substances
  - Organophosphorus Pesticides

- **Ground Water Sampling Plan, Section 3.0, pages 33-34 of 34.**

  All samples will be analyzed for the following parameters that are being used as indicators of drinking water quality under the ongoing RCRA program.

- Arsenic
- Barium
- Cadmium
- Chromium (Hexavalent;-Total)
- Fluoride
- Lead
- Mercury
- Nitrate
- Selenium
- Silver
- Alkalinity as $CaCO_3$
- Carbonate/Bicarbonate
- Ammonia
- Calcium
- Magnesium
- Potassium
- Copper
- Molybdenum
- Nickel
- pH
- Specific Conductance
- Chloride
- Iron
- Manganese
- Phenols (Total)
- Sodium
- Sulfate
- Gross Alpha
- Gross Beta
- Total Organic Nitrogen
- Phosphate

Thirty-six selected ground water samples will be analyzed for HSL volatile and semi-volatile organics, HSL inorganics including cyanide, HSL pesticides/PCBs, primary drinking water substances, and organophosphorus pesticides. These analyses are termed the extended HSL parameters.

Additionally, samples from six wells in the waste pit area will be analyzed for dioxins, 2,3,7,8-TCDD/TCDF and PCDD/PCDF, and 40 selected ground water samples will be analyzed for TOC and TOX.

- **Subsurface Soils Sampling, Section 4.0, page 9 of 9.**

The proposed approach is to subject a sample to a full HSL analysis if one of the following two observations is made:

1. The sample has unusual odor or visual evidence of organic or inorganic contamination; or

2. A relatively high reading occurred during the field screening for volatile organics.

Any samples meeting either of these criteria (with a minimum of two samples per borehole where either one or both criteria are met) will be subjected to a full HSL analysis for volatile organics, semi-volatile organics, and inorganic metals.

- **Surface Water and Sediment Sampling Plan, Section 5.0, pages 18-19 of 19.**

  TOC, TOX, and General Water Quality Parameters

  - Forty-nine surface water samples

  Extended HSL Parameters - (Organic volatiles and semi-volatiles, Inorganics, HSL Pesticides/PCBs, Primary Drinking Water Substances, and Organophosphorus Pesticides.)

  - Seven surface water samples (assumes six seeps)
  - Seventeen sediment samples (assumes six seeps)

  The general water quality parameters will include the following:

  - pH
  - Specific Conductance
  - Chloride
  - Iron
  - Manganese
  - Phenols (total)
  - Sodium
  - Sulfate
  - Gross Alpha
  - Gross Beta
  - Copper
  - Molybdenum
  - Ammonia
  - Alkalinity
  - Magnesium
  - Potassium
  - Calcium
  - Arsenic
  - Barium
  - Cadmium
  - Chromium (Hexavalent, total)
  - Fluoride
  - Lead
  - Mercury
  - Nitrate
  - Selenium
  - Silver
  - Nickel
  - Total Organic Nitrogen
  - Carbonate/ Bicarbonates
  - Phosphate

- **Biological Sampling Plan, Section 6.0, pages 9-10 of 10.**

  Ten percent of the biological samples will also be analyzed for organic and inorganic substances. The 10 percent will include, at a minimum, samples from the drainage downstream from seeps and downstream from the main effluent line.

4.0 QUALITY ASSURANCE PROGRAM

The purpose of a QA program is to establish policies for the implementation of regulatory requirements and to provide an internal means for control and review so that the work performed is of the highest professional standard.

The responsibility for the overall direction of the QA program rests with the QA officer. The QA officer is responsible for maintaining the QA program and verifying its implementation through audits and surveillances.

4.1 Quality Assurance Documents

The QA program is documented in this QAPP and supporting procedures that direct quality-related activities. The policies and procedures specified by these manuals define acceptable practices to be used by personnel. The QAPP is project-specific and serves as the governing QA document for this project.

The QA manuals of IT Analytical Services and IT Engineering Services and Laboratory-Specific Attachments of RSL, Mixed Waste Laboratory, Middlebrook Pike Laboratory, Special Analysis Laboratory, Santa Clara Valley Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and the Export Geotechnical Laboratory are supporting procedures to the QAPP and are controlled documents that are considered proprietary information. Copies of applicable documents can be supplied to WMCO or others as directed by WMCO for this project, if requested.

4.2 Project Quality Assurance Objectives

Project quality assurance objectives are that:

- Scientific data will be of sufficient or greater quality to meet scientific and legal scrutiny;
- Data will be gathered or developed in accordance with procedures appropriate for the intended use of the data; and
- Data will be of known or acceptable precision, accuracy, completeness, representativeness, and comparability as required by the FMPC project.

- Laboratory-Specific Attachments for RSL, Mixed Waste Laboratory, Middlebrook Pike Laboratory, Special Analysis Laboratory, Santa Clara Valley Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and Export Geotechnical Laboratory;

- RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (TEGD), September, 1986.

- Code of Federal Regulations (CFR), 40 CFR 261, Appendix II, "EP Toxicity Test Procedures;"

- U.S. EPA Quality Assurance Handbook, (U.S. EPA 600/9-76-005);

- Proposed Sampling and Analytical Methodologies for Addition to Test Methods for Evaluating Solid Waste Physical/Chemical Methods, U.S. EPA, (PB85-103026);

- American Society for Testing and Materials (ASTM) Standards, Section 11, Volumes 11.01 and 11.02, "Water," and Section 4, Volume 04.08, "Soil and Rock, Building Stones;"

- American Public Health Association, Standard Methods for the Examination of Water and Waste Water, 16th Edition, 1985;

- Methods for Chemical Analysis of Water and Wastes, (U.S. EPA-600/4-79-020);

- Federal Register, Volume 49, October 26, 1984, 40 CFR 136, pages 43234-43436;

- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA (SW-846);

- Handbook for Sampling and Sample Preservation of Water and Waste Water, U.S. EPA (PB83-124503);

- Field and Laboratory Methods Applicable to Overburdens and Mine Soil, (U.S. EPA-600/2-80-054);

- Prescribed Procedures for Measurement of Radioactivity in Drinking Water, (U.S. EPA-600/4-80-032);

- Code of Federal Regulations, 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Processing Plants;"

- American National Standards Institute (ANSI) NQA-1, Quality Assurance Program Requirements for Nuclear Facilities;

8.0 EQUIPMENT CALIBRATION/MAINTENANCE

Measuring and test equipment used in the field and laboratory will be controlled by a formal calibration program (e.g., Section 5.5 of the IT Engineering Services QA Manual, Section 6.1 of the IT Analytical Services QA Manual, Section 7 of the IT/RSL QA Manual, and in Laboratory-Specific Attachments for the Mixed Waste, Middlebrook Pike, Special Analysis Laboratory, Santa Clara Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and Geotechnical Laboratories). The program will provide equipment of the proper type, range, accuracy, and precision to provide data compatible with the specified requirements and desired results. Calibration of measuring and test equipment may be performed internally using in-house reference standards traceable to national Bureau of Standards (NBS) or some other nationally-reliable recognized standard, or externally by agencies or manufacturers.

8.1 Responsibilities

The responsibility for the calibration of laboratory equipment rests with the applicable laboratory manager. The site manager is responsible for the calibration of field equipment and field equipment provided by subcontractors.

8.2 Calibration Procedures

Documented and approved procedures will be used for calibrating measuring and test equipment. Whenever possible, widely-accepted procedures, such as those published by ASTM or the U.S. EPA, or procedures provided by manufacturers in equipment manuals, will be adopted. Procedures for measuring and test equipment routinely calibrated are discussed in the IT Analytical Services QA Manual, the IT/RSL QA Manual, the IT/RSL Radioanalytical Methodology and QA Procedures Manual, and in Laboratory-Specific

Attachments for the Mixed Waste, Middlebrook Pike, Special Analysis Laboratory, Santa Clara Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and Geotechnical Laboratories. Procedures for the calibration of major equipment that may be used for this project are presented in Tables 8-1 through 8-3. Calibration procedures specific to the analytical methods referenced in Tables 4-1 through 4-3 are

Records will be prepared and maintained for each piece of calibrated measuring and test equipment to indicate that established calibration procedures have been followed. Records for subcontractor field equipment used only for this specific project will be kept in the project files. Records for equipment controlled by the IT calibration system (Section 6.0 of the IT Analytical Services QA Manual, Section RS12.0 of the IT/RSL QA Manual, and Mixed Waste, Middlebrook Pike, Special Analysis Laboratory, Santa Clara Valley Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and Geotechnical Laboratory-Specific Attachments) will be maintained by the appropriate IT laboratory.

9.0 LABORATORY ANALYTICAL PROCEDURES

The laboratory analytical procedures required for the FMPC Work Plan are described in the following sections. The analytical procedures for the specific sampling plans are provided in the IT Analytical Services QA Manual, the IT/RSL QA Manual, and the Laboratory-Specific Attachments for RSL, Mixed Waste, Middlebrook Pike, Special Analysis Laboratory, Santa Clara Valley Laboratory, Cerritos Laboratory, Austin Laboratory, PEI Laboratory, Edison Laboratory, and Geotechnical Laboratories.

9.1 Laboratory Program Flow Chart

The generation of project chemical data and results will follow the standard IT laboratory analytical program management scheme as discussed in the above-referenced manuals and attachments. The laboratory analysis flow chart (Figure 9-1) outlines the management scheme, which consists of five major areas:

- Project initiation;
- Handling of collected samples;
- Laboratory testing program initiation;
- Data verification; and
- Report preparation.

These areas are described in Sections 9.0 and 10.0.

9.1.1 Project Initiation

Prior to initiation of laboratory testing, a planning session with the appropriate laboratory and project staffs will be conducted to discuss the specific aspects of the following project tasks that must be completed at this time:

- Define project requirements, including equipment, parameters, sampling procedures (Section 6.0), QC samples, and analytical methods (Section 9.3) selection.

- Request sample bottles from laboratory's sample custodians.

- Prepare sample bottles with appropriate labels and preservatives (Sections 6.6 and 7.1.1).

- Provide blank chain-of-custody and request for analysis forms with sample bottles; these will be shipped to the site.

2.0 PROJECT DESCRIPTION

The tasks that comprise the site characterization for the remedial investigation are as follows: description of current situation, work plan requirements, site investigation, site investigation analysis, laboratory and bench-scale studies, reports, community relations support, and assistance with the Federal Facility Compliance Agreement (FFCA).

The following ten laboratories, which are (1) CLP-certified (presently have a U.S. EPA contract), (2) participate in CLP (presently analyze Performance Evaluation Samples), or (3) participate in the U.S. EPA Cross-Check Program (radiological laboratories only), will be used to analyze FMPC samples.

Laboratory	Type of Analysis
Radiological Sciences Laboratory (RSL) (3) Oak Ridge, Tennessee	Radiological
Mixed Waste Laboratory (MWL) (2) Oak Ridge, Tennessee	Chemical
Middlebrook Pike Laboratory (1, organics only; 2) Knoxville, Tennessee	Chemical
Export Laboratory (1, organics only; 2) Pittsburgh, Pennsylvania	Chemical, Geotechnical
Special Analysis Laboratory (2) Knoxville, Tennessee	Dioxins
Santa Clara Valley Laboratory (1, pesticides only) San Jose, California	Organo-phosphorus pesticides
Cerritos Laboratory (1, organics only; 2) Cerritos, California	Chemical
Austin Laboratory (2) Austin, Texas	Chemical
PEI Laboratory (1, organics only; 2) Cincinnati, Ohio	Chemical
Edison Laboratory (2) Edison, New Jersey	Acute & Chronic

Laboratory-specific attachments of the laboratories are supporting procedures to the QAPP and are controlled documents that are considered proprietary information. Copies of applicable documents can be supplied to WMCO or others as directed by WMCO for this project, if requested.

2.1 Site Description and History

The FMPC is an industrial facility owned by the United States government and operated for the DOE under a management contract with WMCO. WMCO is administratively responsible to the Department of Energy -- Oak Ridge Operations Office (DOE-ORO).

The FMPC is located in a rural area of southwestern Ohio approximately ten miles northwest of Cincinnati and eight miles southwest of Hamilton. The site occupies 1,050 acres and is bounded by Highway 126 to the north, a transmission line to the east, Willey Road to the south, and Paddy's Run Road and the Ohio and Chesapeake Railroad to the west (see Figure 1-1, Work Plan).

The facility commenced operations in 1952; prior to 1986, it was operated by National Lead of Ohio, Inc. (NLO) under contract with DOE. The primary function of the FMPC is the production of metallic uranium fuel cores and other uranium compounds for use in United States defense programs. In addition, small amounts of

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SAFETY	
YES ☐	NO ☒
INVOLVED	

REQUEST NO: 12
Completed by: D Parke
Revision/ 3.1 Issue Date: 9-5-89
DO NOT WRITE IN THIS BLOCK

REQUESTOR Timothy L. Ellenberger PHONE NO.: 738-3100 DATE Sept. 19, 1988
DOCUMENT TITLE QAPP DOCUMENT NUMBER N/A
SECTION/PARAGRAPH/PAGE NO.: Section 6.0/Pg. 3 of 59/Figure 6-1
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

Revision of Water Quality Field Collection Report form ~~and addition of Meter Calibration form~~ to facilitate documentation requirements in the field and data input in the office.

JAW 9/1/89

CONTENT OF CHANGE

See attachment 1 ~~and 2.~~

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: N/A
Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 10-1-88	N/A Mgr 8/5/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
11-7-88	N/A Mgr 8/5/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
10/10/88	M. E. Richardson 8/5/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
Timothy L Ellenberg 20 Sept 88	James A Rayfuse 9/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO X
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO X
C. IMMEDIATE IMPLEMENTATION. YES X NO ____

FERNALD
RI/FS

Date: _____
Time: _____
Page: ____ of ____
Page: _____

WATER QUALITY
FIELD COLLECTION REPORT

PROJECT NAME _____ SAMPLE LOCATION _____
PROJECT NUMBER _____
DATE COLLECTED _____
TIME COLLECTED _____ SAMPLE NUMBER _____
COLLECTED BY _____ SAMPLE TYPE _____

SAMPLING INFORMATION

AIR TEMPERATURE _____
DO SATURATION IN AIR _____
WATER TEMPERATURE _____
DEPTH OF SAMPLE _____
WATER LEVEL _____

FIELD READINGS

	READ 1	READ 2	READ 3
pH			
Spec. Cond. uMHOS/cm			
D.O. MG/L			

METER CALIBRATION

pH Temp.	pH Std.	pH Std.	D.O. Temp.	D.O. Zero	D.O. Full Sc	D.O. Calib. O_2	Spec. Cond. Temp.	Spec. Cond. Low	Spec. Cond. High
OK ✓			OK ✓				OK ✓		

WEATHER CONDITIONS _____
ADDITIONAL REMARKS _____

TEST EQUIPMENT LIST

EQUIPMENT NUMBER	EQUIPMENT NAME

NOTE: ONLY EQUIPMENT SUBJECT TO CALIBRATION NEED BE LISTED.

Figure 6.1

PAGE 1 OF 3 DP 12/14/88

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SAFETY INVOLVED	YES	NO
	☐	☒

REQUEST NO: 15
Completed by: D. Wilde
Revision/ Issue Date: 3.1 1-5-89
DO NOT WRITE IN THIS BLOCK

REQUESTOR Brad Dunning PHONE NO.: 738-3100 DATE 10/13/88
DOCUMENT TITLE QAPP DOCUMENT NUMBER N/A
SECTION/PARAGRAPH/PAGE NO.: 6.1/ 8 / 7 of 59
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION : The paragraph stating that samples will be collected using a positive gas displacement stainless steel and/or Teflon bladder pump or Teflon bailer is overly conservative when analysis of VOA's is not being performed. The stainless steel purge pump and lines are all decontaminated prior to installing into the well. Three well volumes of water are then purged through the pump and hoses prior to sampling. Therefore, at the time of sampling the water sampled is in equalibrium with the natural groundwater.

CONTENT OF CHANGE : Once the well has been purged and allowed to recharge and stabilize, samples will be collected through the stainless steel sampling valve. In the case where samples are being collected to be analized for volitile organics, samples will be collected using either a positive gas displacement stainless Steel and/or Teflon pump or a teflon bailer.

TOC, TOX OR
DP 11/00/88
BLADDER
DP 12/19/88

CANCELLATION INSTRUCTIONS
CANCEL DOCUMENT NO.: n/a TE 10/13/88
Reason for cancellation:

REQUIRED APPROVALS

RT Wilde	12-2-88		
ASI PROJECT DIRECTOR/DATE		MMCO PROJECT MGR./DATE	
David Burke	11/02/88		3-23-89
ASI QA OFFICER/DATE		MMCO IMPACT ASSESS. MGR./DATE	
Robert M Gallowich	10/19/88		
IT PROJECT DIR./DATE		MMCO QA OFFICER/DATE	
Timothy J Ellis	19Oct88	Mary E Stone	1/5/89
IT QA OFFICER/DATE		DOE COTR/DATE	

TO BE COMPLETED BY DOE
A. PRIOR EPA NOTIFICATION REQUIRED ? YES ✓ NO ____
B. PRIOR EPA APPROVAL REQUIRED ? YES ✓ NO ____
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

COTR initials & date

sample withdrawal. If the recovery rate is fairly rapid, and if time allows, evacuation of more than one volume of water is recommended.

- As soon as the well recovers, samples will be collected in accordance with the stability and volatility of the parameters to be tested and the Water Quality Field Collection Report (Figure 6-1) will be completed. For instance, samples for HSL volatile organic compounds, pH, specific conductance, and temperature will be collected first. Parameters which are not sensitive to pH or volatilization should be drawn last.

- For wells that cannot be pumped or bailed dry, at least three well volumes of water will be removed before collecting samples.

- Care will be taken to avoid excessive pumping of a monitoring well. Excessive pumping can lead to an increase or decrease in the concentrations of a contaminant at the sampling point of interest.

- A stainless steel submersible pump will be used to purge the monitoring wells prior to sample collection. A water-level measurement will be initially taken to determine the depth to ground water in the casing. The submersible pump will be lowered to a depth of five to ten feet below the water level, always above the well screen. The well will be initially pruged from this depth so that fresh water from the screened interval will move upward through the casing and completely flush the well. The pumping rate will be less than 20 gallons per minute (gpm) and will continue until field pH, temperautre, and specific conductance readings hav estabilized.

- The purge pump and lines will be decontaminated between wells using procedures as specified below.

- If drawdown is significant, the submersible pump will be lowered during purging to keep the pump five to then feet below the water level in the casing and the pumping rate will be reduced.

- Once the well has been purged and allowed to recharge and stabilize, samples will be collected through the stainless steel sampling valve. In the case where samples are being collected to be analyzied for TOC, TOX, or volatile

organics, samples will be collected using either a positive gas displacement stainless steel and/or Teflon bladder pump or a teflon bailer.

- During sampling, the pump will be operated continuously and the flow rate reduced to one liter per minute for the collection of volatile organic compound samples.

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SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO: 17
Completed by:
Revision/ Issue Date:
DO NOT WRITE IN THIS BLOCK

REQUESTOR Gary Gaillot PHONE NO.: 738-3100 DATE 10/14/88
DOCUMENT TITLE Quality Assurance Project Plan DOCUMENT NUMBER N/A
SECTION/PARAGRAPH/PAGE NO.: Figure No. 5-18, Section 5.6, PG 50 of 70
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

"Cased Hole, Uncased or Perforated Extension of Length, $L_1 - L_2$" is the correct definition for screen length instead of "Soil Flush with bottom of casing."

CONTENT OF CHANGE

See attached.

CANCELLATION INSTRUCTIONS
CANCEL DOCUMENT NO.: N/A
Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 12-2-88	Dennis J. Carr - 12-15-88
ASI PROJECT DIRECTOR/DATE	KMCO PROJECT MGR./DATE
David Bruce 11/30/88	[signature] 12/20/88
ASI QA OFFICER/DATE	KMCO IMPACT ASSESS. MGR./DATE
Robert M. Sollenberger 12/5/88	H. E. Richardson 12-15-88
IT PROJECT DIR./DATE	KMCO QA OFFICER/DATE
Timothy C. Vlenty 10/14/88	Mary E. Elston 1/5/88
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ✓
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

FERNALD
RI/FS

FIELD PERMEABILITY TESTS

FALLING HEAD *

PROJECT ______________________ TESTED BY ______________ DATE ____________

PROJECT NO. ______________________ CALCULATED BY ______________ DATE ____________

BORING NO. ______________________ CHECKED BY ______________ DATE ____________

RADIUS OF TEST BORING, R ______________________

PERMEABILITY, K ______________________

HEIGHT OF CASING (REF. LEVEL) ABOVE GROUND SURFACE, H_C ______________________

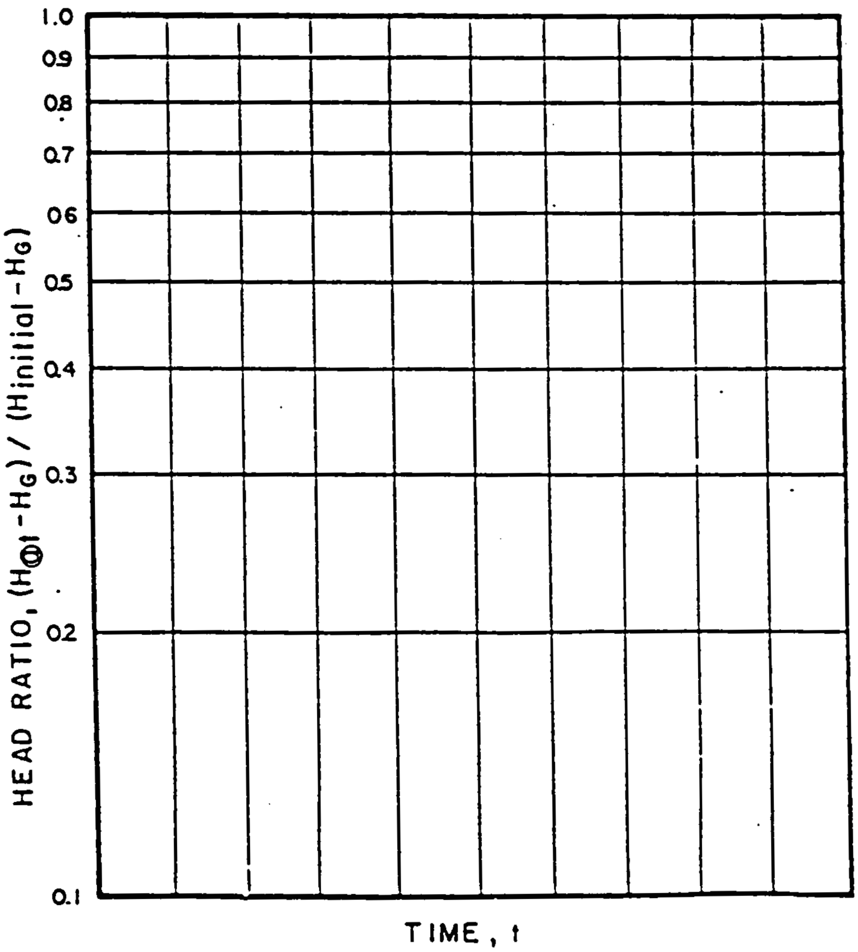
DEPTH TO BOTTOM OF TEST POCKET, L_1 ______________________

DEPTH TO TOP OF TEST POCKET, L_2 ______________________

DEPTH TO GROUNDWATER TABLE FROM TOP OF CASING, H_G ______________________

*CASED HOLE, UNCASED OR PERFORATED EXTENSION OF LENGTH, $L_1 - L_2$.

ELAPSED TIME t SEC.	DEPTH TO WATER IN CASING H Meters



$$K = \frac{R^2}{2(L_1 - L_2)(t_2 - t_1)} \ln\left[\frac{L_1 - L_2}{R}\right] \ln\left[\frac{H_1 - H_G}{H_2 - H_G}\right]$$

NOTE: THE EQUATION ASSUMES THE HORIZONTAL AND VERTICAL PERMEABILITIES ARE EQUAL.

H_1 = DEPTH TO WATER IN CASING FROM TOP OF CASING AT TIME, t_1

H_2 = DEPTH TO WATER IN CASING FROM TOP OF CASING AT TIME, t_2

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PAGE 1 OF 2

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SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO: 20

Completed by: _____
Revision/
Issue Date: _____

DO NOT WRITE IN THIS BLOCK

REQUESTOR John Savage PHONE NO.: (615) 483-1274 DATE Nov. 7, 1988
DOCUMENT TITLE QAPP: Revision 3 DOCUMENT NUMBER Volume V
SECTION/PARAGRAPH/PAGE NO.: Section 12.0/3rd paragraph/pg. 1 of 4
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION Assignment of ASI-QA Officer requires auditing to be performed in accordance with the responsible organization's requirements.

CONTENT OF CHANGE Change 3rd paragraph to read as follows:

"Audits for this project will, as appropriate, cover laboratory activities, field operations and documentation, and final reports. Auditing will be performed in accordance with the applicable section(s) of the Advanced Sciences, Inc. (ASI) Quality Assurance Manual. Internal laboratory audits are also discussed in Laboratory-Specific Attachments."

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: N/A
Reason for cancellation:

REQUIRED APPROVALS

R T Wilde 12-2-88	N/A Rep. 1/11/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
[signature] 11-9-88	N/A 1/11/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
[signature] 12/5/88	H E. Richardson 1/11/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
MA DP 12/6/88	Mary E Stone 3/15/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ✓
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

12.0 QUALITY ASSURANCE AUDITS

To verify compliance with QAPP requirements, the QA officer and other technically qualified personnel (if required) will perform planned and documented audits of project activities. These audits will consist, as appropriate, of an evaluation of QA procedures and the effectiveness of their implementation, an evaluation of work areas and activities, and a review of project documentation. Audits will be performed in accordance with written checklists and, as appropriate, technical specialists. Audit results will be formally documented and sent to project director and supramanagement.

Audits may include, but not be limited to, the following areas:

- Field operation work procedures and records;
- Laboratory testing and records;
- Equipment calibration and records;
- Identification and control of samples;
- Numerical analyses;
- Computer program documentation and verification;
- Transmittal of information; and
- Record control and retention.

"Audits for this project will, as appropriate, cover laboratory activities, field operations and documentation, and final reports. Auditing will be performed in accordance with the applicable section(s) of the Advanced Sciences, Inc. (ASI) Quality Assurance Manual. Internal laboratory audits are also discussed in Laboratory-Specific Attachments."

An individual audit plan shall be developed to provide a basis for each audit. This plan shall identify the audit scope, activities to be audited, audit personnel, any applicable documents, and the schedule. The plan shall be consistent with the project scope of work schedule, and requirements.

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SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO: 23
Completed by: D Ponke
Revision/ Issue Date: 3.1 9-5-89
DO NOT WRITE IN THIS BLOCK

REQUESTOR David Ponke PHONE NO.: (513)738-3100 DATE 12/5/88
DOCUMENT TITLE OAPP Rev. 3 DOCUMENT NUMBER NA
SECTION/PARAGRAPH/PAGE NO.: Section 0.0, Page ii of xii
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

Attachment 1

CONTENT OF CHANGE

Revision of well numbering system from a three digit designation to a four digit designation.

This applies to the work plan and:

Vol. I Sampling Plan
Vol. II Health and Safety Plan
Vol. III Community Relations Plan
Vol. IV Data Management Plan
Vol. V Quality Assurance Project Plan

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: NA
Reason for cancellation:

REQUIRED APPROVALS

KT Wilde 12-7-88	N/A per 1/11/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
David Ponke 12/5/88	N/A per 1/11/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
Walter M Willcutt 12/07/88	H. E. Richardson 8/5/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
NA DA 12/15/88	James A Rayburn 1/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ✓
C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

ATTACHMENT 1

September 8, 1988

Mr. Dennis Carr
DOE/Westinghouse Materials
Company of Ohio
P.O. Box 398704
Cincinnati, OH 45239

SUBJECT: Revision of the Well Numbering System

Enclosed is the revision to the well numbering system.

If you have any questions, please contact me.

Sincerely,

Robert G. Lenyk
Office Manager

RGL:jf

Enclosure

cc/with enclosure: R. Conner, WMCO
D. Wilde, ASI
J. Loving, ASI
K. Sinner, ASI
R. Galbraith, IT
G. Gaillot, IT

10845 HAMILTON CLEVES ROAD • P.O. BOX 475 • ROSS, OHIO 45061 • (513) 738-3100
2620 SAN MATEO NE, SUITE D • ALBUQUERQUE, NEW MEXICO 87110 • (505) 883-0959
2000 NORTH 15TH STREET, SUITE 407 • ARLINGTON, VA 22201 • (703) 243-4900
7308 S. ALTON WAY, SUITE K • ENGLEWOOD, CO. 80112 • (303) 779-0314
107-F JEFFERSON AVE. • OAK RIDGE, TN 37830 • (615) 483-1274
Advanced Sciences, Inc.

REVISION OF THE WELL NUMBERING SYSTEM

Two revisions to the well numbering system for the RI/FS are being made. The first revision is to make the three digit designation a four digit designation. The second change is to assign depth and location designator well numbers to the existing wells that are identified by some other name, such as OS-1 or State 16.

Increase in Identifier Digits

The current practice is to give wells a series designation such as 100, 200, or 300, and a two-digit location such as 14, 64, or 89. The series number provides the depth designation of the well. For example, all 200-series wells are screened across the water table. All 100-series wells are in the till.

The location designation provides the a link between well series. The location designation means that all wells with the same last two digits were drilled in the same location. Thus, if a list of wells such as 215, 346, 315, 115 is provided, the reader instantly knows that three of the wells were drilled to different depths at one location and one well was drilled at another location to the same depth as the deepest well at the first location.

One limitation of this system is that there can be no more than 99 locations. There are only a few remaining location numbers left available in the present three-digit numbering system. This is insufficient to include all off-site wells and the anticipated additional wells that are likely before the RI/FS investigation is completed. The solution to this situation is to increase the number of digits in the location number from two to three. The effect is to shift the series number from the hundreds to the thousands column. Thus, former 100-series wells will become 1000-series, 200-series will become 2000-series, and so forth. Specifically, Well 115 will be 1015, Well 215 will be 2015, Well 315 will be 3015, and Well 415 will be 4015. This allows for the addition of 900 well location numbers, which should be adequate for the investigation and create minimum confusion in the transmission. There will be well numbers beginning with 1100, 2100, and 3100 in the near future that could create some short-term confusion.

Assigning Additional Location Numbers

The current practice is to use well owner's names, Miami Concervancy District well names, or names that were established during the NLO Litigation Study as the identifier for wells that are off-site and were not funded by the DOE. This practice does not allow for the same simple well construction identification as the RI/FS well numbering system. These names are also of variable length and require special handling by the RI/FS Data Base Management System. Because of this, data from these wells may not be included in a particular search request. Table 1 lists the wells currently being used in the RI/FS and the new four-digit well designation that well be used in the future in the RI/FS. The old names are still in the computer system and searches can be made by individual name so that historical data is not lost. In the future, a data request for a map with all uranium values in 2000-series wells for a given sampling period will include the off-site wells. Similarly, maps will appear with the four-digit number so that an observer will know by the well number that the data he is looking at is from a well that samples a specific interval.

Implementation

These changes will become effective on September 9, 1988. This is between quarterly water sampling events and after the completion of the current off-site drilling program. Thus, the changes at this time will have a minimum effect on the day-to-day operations of the RI/FS investigation.

TABLE 1
RE-NAMED WELLS

NEW NAME	PREVIOUS NAME
1124	Cone House
1053	Argonne A-S
3053	Argonne A-D
1054	Argonne B-S
3054	Argonne B-D
1055	Argonne C-S
3055	Argonne C-D
4023* Corrected number	BU-13
2026	BU-101
2036* Corrected number	12-5
1040	RB
2050	Pallet Co.
2056	State 8
2057	State 16
1058	DH
1059	1A
2060	OS-1
1060	OS-1A
2061	OS-2
3062	OS-3
4101	P-1
4102	P-2
4103	P-3
3063	James Dill
3099	Robert James
3100	Charles Young
2121	BU-91
2122	BU-92
2123	12-3
2104	BPH
2105	State-10

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DOCUMENT CHANGE REQUEST.

This form is used to initiate and update RI/FS plans and procedures, only.

SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO:	25
Completed by:	D Burke
Revision/ Issue Date:	3.1 9-5-89
DO NOT WRITE IN THIS BLOCK	

REQUESTOR ROBERT SOBOCINSKI PHONE NO.: 513-738-3100 DATE 12-20-88

DOCUMENT TITLE QAPP Rev. 3 DOCUMENT NUMBER NA

SECTION/PARAGRAPH/PAGE NO.: Section 6.2

ISSUE DATE January 1987 LATEST REVISION DATE March 1987

JUSTIFICATION : Addition of Alkalinity to Section 6.2 for Field Analytical Procedures for ground water samples.

CONTENT OF CHANGE : Add Section 6.5.2 on Alkalinity per attached pages.

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: NA

Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 1-24-89	N/A HER 8/5/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
David Burke 12/28/88	N/A HER 8/5/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
Robert M Gallimore 1/5/89	W.E. Richardson 8/5/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
NA DB 12/28/88	James A Redfearn 8/1/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES X NO ____

B. PRIOR EPA APPROVAL REQUIRED ? YES X NO ____

C. IMMEDIATE IMPLEMENTATION. YES X NO ____

- Frequently change and calibrate membrane electrode to eleminate interference from gases other than oxygen.
- Rinse probe with distilled water between each measurement.
- Store the probe in a water-saturated air environment.

References

1. American Public Health Association, et al., 1985, Standard Methods for the Examination of Water and Wastewater, 16th Edition, Method 421F, pp. 422-426.

6.2.5 Alkalinity

Scope and Application

Alkalinity is a measure of the acid buffering capacity of a sample and is formally defined as the equivalent sum of bases that are titratable with a strong acid. The carbonate species, bicarbonate, HCO_3^-, and carbonate, CO_3^{-2}, are the dominant bases which contribute to alkalinity in most natural waters. Since alkalinity concentration is affected by changes in temperature, pH, and degassing, the alkalinity analysis should be performed in the field as soon as possible after collection. Uranium and other radionuclides form carbonate complexes; therefore, an accurate determination of carbonate concentration is necessary to quantify radionuclide mobility in ground water.

Summary of Method

Bicarbonate and carbonate concentrations are determined by electrometric titration. A strong acid of known concentration is added to a water sample while the pH of the sample is monitored. Using the acid volume needed to reach the end point, the concentration of bicarbonate and carbonate is calculated.

Apparatus

- pH meter that can be read to 0.01 units
- pH probe
- pH buffer solutions
  - pH 4.0
  - pH 7.0
- 50 milliliter (ml) buret
- Volumetric pipet (Class A)
- Magnetic stirrer and small teflon stir bar
- Buret stand and clamp
- 250 ml beaker or flask
- Standardized sulfuric or hydrochloric acid, approximately 0.02 normal

Calibration

Follow the manufacturer's instructions for calibration of the pH meter. Calibrate the meter daily before starting titrations.

Sample Measurement

- Fill buret with acid; open stopcock and drain out some acid to remove all air bubbles.
- Place a clean dry teflon stir bar into a clean dry 250 ml beaker.
- Pipet 50.0 ml of sample into the beaker.
- Place beaker onto center of stirring plate and gently place the clean, dry, pH probe into the beaker. Position buret over the beaker.
- Record the initial pH of the sample to the nearest 0.01 pH unit. Record to the nearest 0.01 ml the initial acid volume in the buret.
- Turn on stirring mechanism to a gentle or slow setting.

- Titrate acid into the sample. If the sample pH is not near an endpoint, i.e., pH greater than 9 or pH between 5 and 8, acid can be titrated in volumes sufficient enough to lower the pH by 0.2 to 0.5 units. However, when the pH of the sample is near an endpoint, i.e., between pH 8 and 9, or between pH 4 and 5, titrate dropwise, as very small additions of acid will cause large changes in sample pH.

- Turn off the stirring mechanism after allowing sufficient time for the sample to mix thoroughly.

- Record the acid volume and pH.

- Repeat titration of acid into the sample until the pH of the sample is in the range of 3.0 to 3.5.

Measure Practices

- Keep buret full between titrations. This will prevent a film from developing on the inside of the buret.

- Clean glassware and stir bar in a soap bath and rinse three times with deionized water. Rinse the pH probe with deionized water only.

References

1. American Public Health Association, American Water Works Association and Water Pollution Control Federation, 1985, "Standard Methods for the Examination of Water and Wastewater," (16th ed.); Washington, D.C., American Public Health Association, 1268 pp.

2. Skougstad, M.W., M.J. Fishman, L.C. Friedman, D.E. Erdmann, and S.S. Duncan, (eds.), 1979, "Methods for Determination of Inorganic Substances in Water and Fluvial Sediments: Techniques of Water - Resources Investigations of the U.S. Geological Survey," Book 5, Chapter A1, 626 pp.

3. U.S. Environmental Protection Agency, 1983, "Methods for Chemical Analysis of Water and Wastes," EPA-600/4-79-020, Cincinnati, Ohio, U.S. EPA, Environmental Monitoring and Support Laboratory, Office of Research Development, 460 pp.

6.3 SURFACE WATER SAMPLING

The procedures and practices described herein are applicable to the collection of water samples from streams, ponds, lakes, rivers, springs, and seeps. Basically, there are two different techniques for collecting surface water samples. They are:

- Grab sampling; and
- Composite sampling.

Whether the technique of sampling is grab or composite sampling, the following practices will be observed:

- The sample container will be clean and uncontaminated. Appropriately cleaned sample containers with or without preservatives are prepared by the laboratory prior to shipment to the field. Sample containers with preadded preservatives will be filled to the top without overflowing to prevent loss of the preservatives. Do not rinse sample containers.
- The point of sampling will be chosen with care so that a representative sample of the water to be tested is obtained. Choose the location of the sampling point with respect to the information desired and in conformity to local conditions.
- Avoid sampling when there is visible surface debris or when artificial turbulence is present in the stream.
- Do not use container with preservatives to collect water samples direct[illegible] of water. Use a separate container [illegible]ple collection and transfer the wa[illegible]iners with preservatives.

RI/FS
DOCUMENT CHANGE REQUEST

This form is used to initiate and update RI/FS plans and procedures, only.

SAFETY	
YES	NO
☐	☒
INVOLVED	

REQUEST NO:	26
Completed by:	D. Ponke
Revision/ Issue Date:	3,1 9-5-89
DO NOT WRITE IN THIS BLOCK	

REQUESTOR Jeff Whitesides/David Ponke PHONE NO.: 738-3100 DATE 1/18/89
DOCUMENT TITLE OAPP Revision 3 DOCUMENT NUMBER N/A
SECTION/PARAGRAPH/PAGE NO.: Section 5.1.1.2, Page 6 of 70, Section 5.1.4, Page 23 of 70
ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION

See Attachment 1

CONTENT OF CHANGE

Section 5.1.1.2, Page 6 of 70

Section 5.1.4, Page 23 of 70

CANCELLATION INSTRUCTIONS
CANCEL DOCUMENT NO.: N/A
Reason for cancellation:

REQUIRED APPROVALS

RT Wilde 1-23-89	N/A per E&R 8/5/89
ASI PROJECT DIRECTOR/DATE	WMCO PROJECT MGR./DATE
David Ponke 1/23/89	N/A per E&R 8/5/89
ASI QA OFFICER/DATE	WMCO IMPACT ASSESS. MGR./DATE
Robert M Dalrymple 1/24/89	H. E. Richardson 8/5/89
IT PROJECT DIR./DATE	WMCO QA OFFICER/DATE
NA DD 1/23/89	James A Reynolds 8/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO X
B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO X
C. IMMEDIATE IMPLEMENTATION. YES X NO ____

Attachment 1

JUSTIFICATION

1. QAPP Section 5.1.1.2 Page 6 of 70 , second and third bullet, requires that a daily standard be calculated and a control chart be prepared.

ACTUAL IMPLEMENTATION:
A control chart was established to verify that each instrument was responding in a reproducible manner, five one-minute counts were recorded and used to calculate the mean and standard deviation. After the instrument was in use approximately ten days, the average values of the daily one-minute counts from the previous ten days were used to calculate the mean and standard deviation. Each day an instrument was used, the average of the five one-minute counts was plotted on the control chart. This control chart graphically presents the instrument's response to a standard source throughout the project.

The QAPP requires clarification of Section 5.1.1.2. This is in response to WMCO Surveillance No. 88-616.

2. QAPP Section 5.1.4, page 23 of 70, second bullet, requires that a weekly correlation of the SPA-3 to the PIC be performed.

ACTUAL IMPLEMENTATION:
The correlation was made for every PIC measurement at least weekly. However, the correlation was made for every PIC measurement rather than once per week. During certain weeks, the correlation was made as many as fifteen times per week. During a week where there were no PIC measurements, no correlation was made.

The QAPP requires clarification of Section 5.1.4. This is in response to WMCO Surveillance No. 88-616.

- Increase HV (if HV potentiometer is at a minimum, it will take approximately 3 turns before any change is indicated). While increasing the HV, observe the log scale of the ratemeter. Increase HV until ratemeter indication occurs.
- Switch the WINDOW IN/OUT to IN.
- Turn the HV control until maximun reading occurs on the log scale. Increase HV until reading starts to drop off. Then decrease the HV for maximum reading.
- Turn RANGE selector switch to the X1K position.
- Press ZERO button. If meter does not read, switch to a lower range until a reading occurs.
- Carefully adjust the HV potentiometer until maximum reading is achieved on the range scale. The instrument is now peaked for daughters of uranium-238 on both the LOG and RANGE scales.

5.1.1.2 Daily Instrument Standardization

Following completion of the instrument setup procedure, establish a fixed source-detector geometry so that the source-to-detector distance is a matter of record and reproducible from one day to the next. Standardize the FIDLER as follows:

- Make five one-minute counts with the Am-241 source in its check position, find the average of these counts. Record each count on the "Instrument Checks" form (Figure 5.2).
- Over a period of ten (10) days, determine the standard deviation from the average of the five one-minute daily counts. Record this value (σ) and three times the value (3σ) in the instrument logbook.

$$\text{standard deviation } \sigma = \left[\frac{(\Sigma x^2) - (\Sigma x)^2}{n(n-1)}\right]^{0.5}$$

- A control chart will be prepared using information from the previous two steps. This chart will be prepared at the beginning of the site characterization and will be used each day to record the FIDLER's response to the

Am-241 source. On a piece of linear graph paper, place consecutive calendar dates on the x-axis. Define a range along the y-axis which includes the average FIDLER source count $\pm$ 3 times the standard deviation. Draw three horizontal lines which intersect the y-axis at these three points.

This procedure is referenced in the manufacturer's operation manual. Various other manufacturers' instructions for operation of the large-volume scintillation detector may be used.

Large-Volume Scintillation Detector Operational and Field Measurement Procedure

Set up the detector and perform the field measurement according to the following instructions:

- Check proper operation of the detector and its associated ratemeter/scaler according to the manufacturer's instructions.
- Perform correlation of the detector according to Section 5.1.3.2 each time a measurement is taken and record the results on the Gamma-Ray Exposure Rate Survey form (Figure 5-2).
- Perform daily source checks using a 0.1 μCi Cesium-137 check source and record the response on the Instrument Checks from (Figure 5-2).
- Perform daily background checks at the field office and record the response on the Instrument Checks form (Figure 5-2).
- For walkover surveys, proceed to the assigned grid area and reset the scaler on the ratemeter/scaler.
- Subdivide the 100-foot by 100-foot grid into 16 squares, each 25 feet by 25 feet.
- At one corner of the grid, start the scaler and timer and walk at a steady rate (approximately two feet per second) over the subgrid, beginning along one side and covering the entire grid in a rectilinear fashion until all areas have been surveyed.
- The scintillation detector should be suspended by a rope or strap and swung from side-to-side in a serpentine fashion. Each 25-foot by 25-foot subgrid should be surveyed in approximately two minutes.
- During the walkover, survey meter count rate may be monitored with earphones, if necessary. Any location with an elevated count rate (indicated by a higher

pitch in the earphones) in localized areas will be marked by dropping a weighted flag, and the survey will continue at the same pace.

RI/FS
DOCUMENT CHANGE REQUEST

This form is used to initiate and update RI/FS plans and procedures, only.

SAFETY INVOLVED	YES	NO
	☐	☒

REQUEST NO:	28
Completed by:	D. Ponke
Revision/ Issue Date:	2.1 9-5-89
DO NOT WRITE IN THIS BLOCK	

REQUESTOR DAVID PONKE PHONE NO.: 513-738-3100 DATE 1/30/89

DOCUMENT TITLE QAPP Vol. V DOCUMENT NUMBER NA

SECTION/PARAGRAPH/PAGE NO.: Section 15.0 DOCUMENT CONTROL

ISSUE DATE January 1987 LATEST REVISION DATE March 1988

JUSTIFICATION SECTION 15 IS A COMPLETE REWRITE. DP 8/7/89

Clarification of Section 15 due to personnel changes and responsibilities. The addition of a computer graphics development section, ADDED DOCUMENT CONTROL FOR COMPUTER GRAPHICS, UPDATED THE PERSONNEL FOR APPROVAL OF DOCUMENTS AND DRAWINGS., VARIANCES ADDED TO DOCUMENT CONTROL. DP 8/7/89

CONTENT OF CHANGE

Per attachment sheets

CANCELLATION INSTRUCTIONS

CANCEL DOCUMENT NO.: NA

Reason for cancellation:

REQUIRED APPROVALS

Robert G Lamb 4/19/89	NA DP
ASI PROJECT DIRECTOR/DATE	NWCO PROJECT MGR./DATE
David Ponke 4/19/89	NA DP
ASI QA OFFICER/DATE	NWCO IMPACT ASSESS. MGR./DATE
Robert M DeWitt 4/19/89	W.E. Richardson 8/14/89
IT PROJECT DIR./DATE	NWCO QA OFFICER/DATE
NA DP	James A Reffington 9/5/89
IT QA OFFICER/DATE	DOE COTR/DATE

TO BE COMPLETED BY DOE

A. PRIOR EPA NOTIFICATION REQUIRED ? YES ____ NO ✓

B. PRIOR EPA APPROVAL REQUIRED ? YES ____ NO ✓

C. IMMEDIATE IMPLEMENTATION. YES ✓ NO ____

15.0 DOCUMENT CONTROL

Project specific documents and drawings must be reviewed, approved, distributed, and revised as necessary.

15.1 Review and Approval of Documents and Drawings

Prior to use, the following documents and drawings must be reviewed and approved by the personnel identified:

- Quality Assurance Project Plan
  - Project QA Officer
  - ASI Project Director
  - WMCO QA Officer
  - DOE Contracting Officer's Technical Representative
  - IT TECHNICAL MANAGER (REVIEW ONLY) DP 8/7/89
- Other Project Specific Documents (such as the Work Plan, Sampling Plan, etc.)
  - Project QA Officer
  - IT Technical Manager
  - ASI Project Director
  - DOE Contracting Officer's Technical Representative
  - WMCO QA OFFICER (REVIEW ONLY) DP 8/7/89
- Drawings, including computer graphics and maps
  - Draftperson/Preparer
  - Checker
  - IT Technical Manager
  - ASI Project Director
  - DOE Contracting Officer's Technical Representative DP 8/1/89

Approval of these documents and drawings will be denoted by a signature and date. All documents and drawings will be reviewed and approved by the designated ASI and IT personnel before they are submitted to DOE for their review and approval. Requests for a copy of a document or a design drawing before it has gone through the complete review and approval process will merit the document or drawing to be marked "Preliminary."

15.2 Distribution

Documents and drawings will be distributed as requested to ASI, IT, WMCO, and DOE personnel. The Project QA Officer will control distribution of all quality-related documents, including the QAPP, Work Plan, and Sampling Plan. The Project Director will control distribution of all other documents and drawings. When a document or drawing is no longer needed, it will be destroyed or returned to the issuing group. Each copy of the QAPP, Work Plan, Sampling Plan, Health and Safety Plan, and Community Relations Plan will be identified with a document control number. The Project QA Officer will maintain a status log showing the name, control number, and mailing address of each controlled copyholder. THE PROJECT DIRECTOR WILL ALSO MAINTAIN A LOG FOR ALL OTHER DOCUMENTS AND DRAWINGS. DBaker 8/14/89

15.3 Revision of Documents and Drawings

Whenever a document or drawing cited in Section 15.1 is revised, a new review and approval of the revision will be required in accordance with the requirements of the original document or drawing.

Revisions will be issued to all holders of the original document or drawing. For the QAPP, Work Plan, Sampling Plan, Health and Safety Plan, and Community Relations Plan, each copyholder will sign a revision receipt verifying that the revision has been received and properly placed in the document. The receipt will be returned to the Project QA Officer. The Project Director, will control distribution of all other documents or drawings.

DP 8/4/89 REVISION RECEIPTS WILL BE RETURNED TO THE PROJECT DIRECTOR.

Revisions to documents will be denoted by adding the revision number and revision date to the document title page (if reissued), revised signature page (if reissued), and each page that has been revised. Revisions to design drawings will be denoted by including the consecutive revision number and revision date in the appropriate block on the drawing and revised signature block.

Revisions to the QAPP, Work Plan, Sampling Plan, Health and Safety Plan, and Community Relations Plan will be accomplished by either a general revision in which all pages are replaced, or a limited revision in which only certain pages are replaced. For a general revision, all pages will be identified with the general revision number (e.g., 4, 5, 6, etc.) and the revision date. For a limited revision, each revised page will be pink in color and identified with the current general revision number and sequential suffix (e.g., Rev. 4.1, 4.2, 5.1, etc.) and the revision date. When necessitated by the change, additional pages will retain the original page number with a sequential suffix (e.g., page 4.1 of 6). Each limited revision will be transmitted by a revision log sheet that lists all revised pages for that revision. The log sheet is to be filed in the front of the

revised document. Each revised page in both general and limited revisions will have a vertical line in the right hand margin adjacent to the revised material. Document title pages and signature pages are not required for limited revisions.

15.4 Initiating Changes to Documents

Changes to approved plans and procedures are likely to be necessary during the course of project performance as a result of new information or events that occur during performance. Changes to previously approved plans and procedures must be approved before the change is implemented.

15.4.1 Variances

A variance is an approved ~~deviation~~ VARIATION DP 8/14/89 from a previously approved project specific procedure, such as the QAPP, Work Plan, Sampling Plan, etc. AND DOES NOT IMPACT THE QUALITY OF THE WORK. DP 8/14/89 Variances are recorded on the VR form shown in Figure 15-1 and must be approved by the Project Director and the Project QA Officer before they are implemented. The approval can be oral, when necessary, provided that written approval is obtained within 5 working days.

Variances do not normally result in revisions to project-specific documents. They are a means of accomplishing on-the-spot changes to project specific procedures when the change is necessary for work to proceed. The change is ~~normally~~ DP 8/14/89 a one-time change that is valid only for the specific activity ~~described~~ SPECIFIED DP 8/14/89 in the VR.

Variance Request forms are initiated as follows:

- The person identifying the need for the variance (the requestor) completes the VR form shown in Figure 15-1 through the REQUESTED BY entry, except for the variance number, which is supplied by the Project QA Officer.

- The requestor obtains the signatures of the Project Director and the Project QA Officer. When necessary, such as when communicating by telephone, the Project Director or the Project QA Officer can orally give their approval to the requestor. In this instance, the requestor notes on the VR, in an area other than in the approval signature spaces, that oral approval has been granted, along with the approvers' names and the date and time that approval was granted. Written approval must be obtained by the requestor within 5 working days. When obtaining the approval of the Project QA Officer, the requestor also obtains the VR number and enters it on the VR.

- When approvals have been obtained, the change described on the VR can be implemented.

- The original of the VR is provided to the Project QA Officer for appropriate distribution and forwarding to the project files. The Project QA Officer also evaluates the VR to determine whether or not a revision to the project-specific document is required, and, if appropriate, issues a DCR within 10 working days.

FMPC RI/FS

VR No. _____

VARIANCE REQUEST

Page ___ of ___

Date: _____

VARIANCE (INCLUDE JUSTIFICATION)

APPLICABLE DOCUMENT(S) AND SECTION NO.(S)

CC:

REQUESTED BY: _____ Date: _____

Approved By: _____ Date: _____
Project Director

_____ Date: _____
Project Quality Assurance Officer

FOR-008

Figure 15-1

The Project QA Officer is responsible for maintaining a log that shows for each issued VR, the number, date of issue, requestor, effected document and section, and subject matter.

15.4.2 Document Change Requests

A DCR is a means of initiating a revision to a previously approved project-specific procedure, such as the QAPP, Work Plan, Sampling Plan, etc. DCRs are recorded on the DCR form shown in Figure 15-2. Review and approval of the DCR's shall be in accordance with the requirements of the original document before they are implemented. For DCRs that involve changes to analytical laboratory activities, review by the responsible laboratory director is also required. The Project Director or the Project QA Officer may request oral approval from the other signatories when necessitated by circumstances. If the other signatories orally approve and consent for the DCR to be signed for them, the Project Director or Project QA Officer may sign their own name in the other person's signature space and write "for" before the person's printed title below the signature space.

DCRs always result in revisions to project-specific documents, as opposed to VRs, which normally do not result in revisions.

DCRs are initiated as follows:

- The requestor (normally the person who identifies the need for the change) completes the DCR form up to the EFFECTIVE DATE OF CHANGE.

- The requestor forwards the DCR to the Project QA Officer for evaluation.

- If he concurs with the DCR, the Project QA Officer enters a number in the REQUEST NO. space and also signs and dates the DCR in the appropriate space. If he does not concur, he resolves the disagreement with the requestor.

- The Project QA Officer enters the pertinent information in a DCR status and tracking log that shows the DCR number, requestor, request date, subject matter, affected document and section number(s), transmittal and return date from each signatory, distribution date to each document holder, and issue date of revised pages to the document.

- The Project QA Officer makes a copy of the DCR and forwards the original to the Project Director with a request to review, approve and return to the Project QA Officer. The date is recorded in the DCR status and tracking log.

- When the signed DCR is returned from the Project Director, the Project QA Officer makes the appropriate entry in the DCR status and tracking log, and repeats the forwarding process until all required signatures have been obtained. If any signatory refuses to sign the DCR, that signatory is responsible for communicating to the Project QA Officer the reasons for not signing. The Project QA Officer coordinates the resolution of the disagreement of the DCR, consulting with the Project Director as necessary. In the event that a

DOCUMENT CHANGE REQUEST

This form is used to initiate permanent changes to controlled distribution project-specific procedures, such as the QAPP, Work Plan, and Sampling Plan.

REQUEST NO. _____
Issue Date: _____
Page ____ of ____
Do Not Write In This Block

REQUESTOR: _____ PHONE NO.: _____ DATE: _____

DOCUMENT TITLE: _____

SECTION/PARAGRAPH/PAGE NO.: _____ DOCUMENT NUMBER: _____

ISSUE DATE: _____ LATEST REVISION DATE: _____

JUSTIFICATION:

CONTENT OF CHANGE:

EFFECTIVE DATE OF CHANGE:

☐ When all approvals have been obtained: _____
Effective Date

☐ Other (Specify): _____

REQUIRED APPROVALS:

Project Director	Date		
Project QA Officer	Date	WMCO QA Officer	Date
Technical Manager	Date	DOE COTR	Date

TO BE COMPLETED BY DOE

A. Prior EPA notification required?	☐ Yes	☐ No
B. Prior EPA approval required?	☐ Yes	☐ No
C. Immediate implementation?	☐ Yes	☐ No

Figure 15-2

decision is made to not proceed with the issue of the DCR, the Project QA Officer notifies the requestor and all signatories who have previously signed the DCR of this decision. An appropriate entry to this effect is made in the DCR status and tracking log.

- When all required signatures have been obtained, the project QA Officer issues the DCR to all holders of controlled copies of the affected document(s). The change described by the DCR is to be implemented on the date specified in the EFFECTIVE DATE OF CHANGE space on the DCR.

- The effective date of change and issuance of the DCR is dependent on DOE addressing the section at the bottom of the DCR for EPA notification, EPA approval, or immediate implementation.

Each controlled document copyholder who receives an approved DCR is responsible for inserting a copy of the DCR in the front (or other appropriate location) of the affected document(s). Until revised document pages are issued, the DCR serves as the controlled document copy holder's official notification that the document has been changed as described in the DCR.

Subsequent to issuing a DCR, the Project QA Officer will, as soon as feasible, issue revised document pages incorporating the change described in the DCR. Upon receipt of the revised pages, at the controlled document copyholder's option, the DCR may be discarded or retained. If retained, a notation will be made on the DCR that the change has been incorporated in a revision.

15.5 Computer Graphics Development

The following apply to all computer generated graphics produced from the Fernald database for use in the Remedial Investigation/Feasibility Study. This specifically includes visual displays generated using SAS, SAS Graph, CPS-PC, Autocad, or Freelance software.

15.5.1 Distributed Data

File Transfers - All data obtained from the database for display in graphic form is to be downloaded to a local microcomputer using Kermit File Transfer Protocol. If a location identification is to be used, the coordinates must be transferred simultaneously with the other data and accordance with 15.5.2.

Local Files - Neither the data read to a local computer from the database or the date of data file creation may be altered in any way. This includes data read into a flat file, SAS dataset, an Autocad file, or a Lotus 1-2-3 file. Each individual graphics producer is responsible for maintaining a record of the data filename and the graphic filename used for computer generated graphics and maps.

15.5.2 Location Coordinates/Elevations

Location identification in all graphics will be by State Planar Coordinates. This applies to all sample collection locations and all well locations. Elevation data will be reported relative to Mean Sea Level.

All elevation or coordinates data will be derived from the survey data maintained as part of the Project record.

15.5.3 Labeling

15.5.3.1 General

DP 8-1-89

Graphics shall ~~possible~~ be titled so as to clearly identify the parameter or parameters displayed. Reporting units must be included on each. Standard two-dimensional (X-Y) or three-dimensional plots must have a scale showing the range of values being displayed.

All graphics which contain data that has not been completely verified shall include the label,

"Preliminary Data: Not for Distribution or Publication"

also labels for,

"Validation Level I" and **"Validation Level II"**

Validation Level I	All data transferred electronically will be manually verified against signed, hard copy reports.
Validation Level II	Result of technical analysis of all data to date.

Graphics produced during the development of software programs to be used for demonstration purposes should be labeled according to Section 15.5.3.1 above and should also include the label "developmental".

15.5.3.2 Three-Dimensional Plots

In addition to the preceding requirements, these plots must include a north arrow showing two-dimensional rotation. They must also indicate degrees of rotation from the horizontal.

15.5.3.3 Maps

Maps must also show the following:

a. File name;
b. Last date of generation and dates of preceding versions;
c. Preparer and checker initials by each generation/revision date;
d. North arrow and scaler bar.

Maps approved in accordance with 15.1 will be read into plot files with the file extension ".plt". These maps can be made available for use in the on-site map production center.

The map production center display case will contain a hard copy version of each computer generated map.

Example Format:
a. File name;
b. Paper size;
c. File size;
d. Layers included;
e. Description, including any parameters overlaid;
f. All revisions and reasons for change, initialed by preparer and checker;

g. Sign-off by the technical Manager and Project Director for all versions/revisions.

The map production center will also contain a hard copy record for all revisions to the basic map file used with overlays. All revisions or updates to the basic file will be documented, giving date of revision, nature of revision, reason for revision, and person incorporating the revision. An example of a "revision" in this case would be the extension of the area shown in the basic map incorporating the addition of digitized data. The movement of an object relative to the original digitized data file is an example of a change which would not qualify as a revision.

Maps employing data not obtained directly from the database will be labeled with the source of the data.

15.5.4 Trial Runs To Determine Data Placement

Draft graphics initially produced to ascertain data placement, such as where the software employed might cause values to be printed illegibly and placement adjustment may be required to allow readability are exempted from the requirements of 15.5.1, 15.5.2, and 15.5.3. Under no circumstances are such materials to leave the site of generation. In addition, they must be marked "Data Placement Trial Run."

Department of Energy
FMPC Site Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6319

1431

July 10, 1990
DOE-1410-90

John D. Wood, Project Director
Advanced Sciences, Inc.
11003 Hamilton-Cleves Road
P. O. Box 475
Ross, OH 45061

Dear Mr. Wood:

DOCUMENT CHANGE REQUEST NO. 45

Your request to use eight-inch diameter temporary casing instead of ten-inch casing is approved for immediate implementation. The approved document change request is enclosed.

If your staff has any questions, please ask them to contact Oba Vincent, of my staff, at (513) 738-6937.

Sincerely,

Bobby Davis
Contracting Officer's
Representative

DP-84:Vincent

Enclosure: As stated

cc w/encl.:

H. E. Richardson, WMCO

DOCUMENT CHANGE REQUEST

This form is used to initiate permanent changes to controlled distribution project-specific procedures, such as the QAPP, Work Plan, and Sampling Plan.

REQUEST NO. 45
Issue Date: 6-28-90
Page ____ of ____
Do Not Write In This Block

REQUESTOR: W. Hertel PHONE NO.: 738-3100 DATE: 6-28-90

DOCUMENT TITLE: RI/FS Workplan Volume V QAPP

SECTION/PARAGRAPH/PAGE NO.: Five, First, 24.2 of 70 DOCUMENT NUMBER: NA

ISSUE DATE: March 31, 1988 LATEST REVISION DATE: ____

JUSTIFICATION: Due to the unreliability of the presently used nominal ten-inch diameter temporary casing, it is requested that eight-inch diameter casing be used for 2000, 3000, and 4000 series monitor wells until reliable ten-inch casing can be obtained. Substitution of eight-inch casing will allow continued full utilization of the drilling crews presently on-site.

CONTENT OF CHANGE: Volume V Section 5 page 24.2 of 70 RI/FS Work Plan Revision 3.2

See attached page 24.2 underlined and bolded section for content of change.

EFFECTIVE DATE OF CHANGE:

☐ When all approvals have been obtained: ____ Effective Date

☐ Other (Specify): ____

REQUIRED APPROVALS:

Project Director: David Burke	Date: 6/28/90	WMCO QA Officer: H.E. Richardson	Date: 7/6/90
Project QA Officer: [signature]	Date: 6/28/90	BOE COTR: [signature]	Date: 7/6/90
Technical Manager: [signature]			

TO BE COMPLETED BY DOE

A. Prior EPA notification required?	☑ Yes	☐ No
B. Prior EPA approval required?	☐ Yes	☑ No
C. Immediate implementation?	☑ Yes	☐ No

FORM007

- After the walkover of the grid is completed, the scaler and timer are stopped and the following items are recorded on the Surface Measurements Field Logbook Form (Figure 5-3): (1) grid ID number, (2) the total count, and (3) the elapsed time.

- Return to each location which has been "flagged" within the grid and perform a systematic survey beginning at the flag and working outward to determine the areal extent of the elevated reading.

- Record the highest count rate and the approximate location and areal extent; insert a marker at the location of highest reading.

5.2 Drilling Procedures

Soil borings are made to determine the nature, arrangement, thickness and extent of the soil strata. The depth of borings, frequency, and the type of testing and sampling required are dependent upon the purpose of the subsurface investigation.

Borehole advancement for monitoring wells will be performed using cable tool drilling techniques. The use of mud rotary or continuous flight hollow stem augers is prohibited for monitoring wells. A soil auger drilling rig will be used to collect undisturbed soil samples in clay layers that may be found in the till. With the cable tool techniques, the hammer is used to dislodge the soils and mix them with potable water for recovery and removal from the hole. Cable tool borehole drilling will be performed in accordance with Section 2.2.5, Percussion Drilling Borehole Advancement, IT Manual of Practice, Subsurface Investigations.

Comments from the IT Manual of Practice, Subsurface Investigations pertinent to the cable tool drilling technique follow:

- When advancing the boring using cable tool drilling techniques, a temporary steel casing will be

DOCUMENT CHANGE REQUEST NO. 45

drilled, driven, or pushed as the borehole is advanced. **The temporary casing will be threaded, nominal ten-inch diameter for constructing 1000 series monitor wells. The temporary casing will be threaded, nominal eight-inch or nominal ten-inch diameter to allow for the construction of the monitoring well in the 2000, 3000, and 4000 series borings.** Additionally, the temporary casing in the 4000 series boring may be nominal ten-inch diameter to approximately 150 foot depth, then telescope to nominal eight-inch diameter to allow for the construction of the monitoring well. Cuttings will be removed from the borehole using a sand pump or dart valve bailer.

THE CONTENT OF CHANGE IS UNDERLINED ABOVE

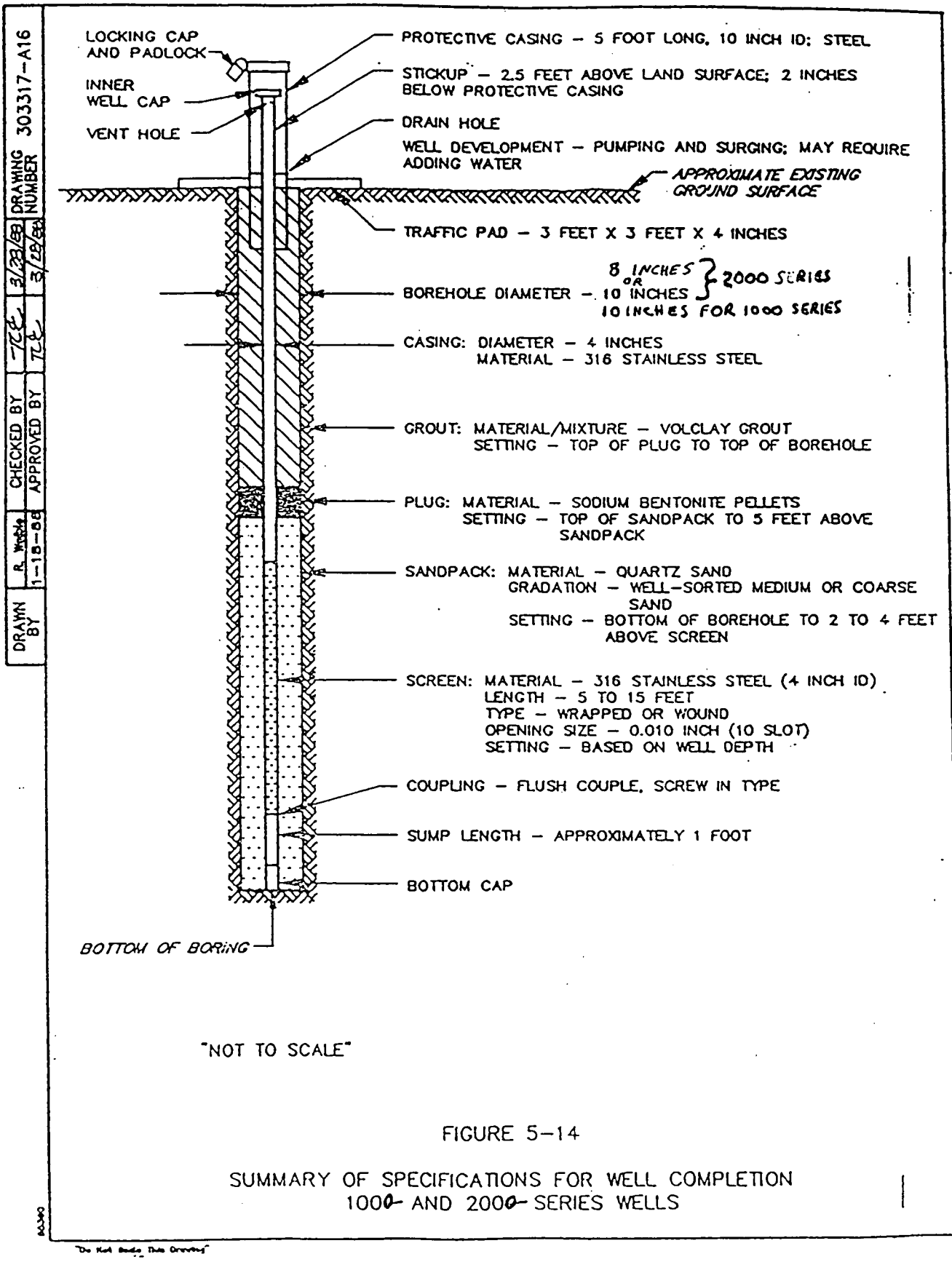

FIGURE 5-14

SUMMARY OF SPECIFICATIONS FOR WELL COMPLETION
1000- AND 2000-SERIES WELLS

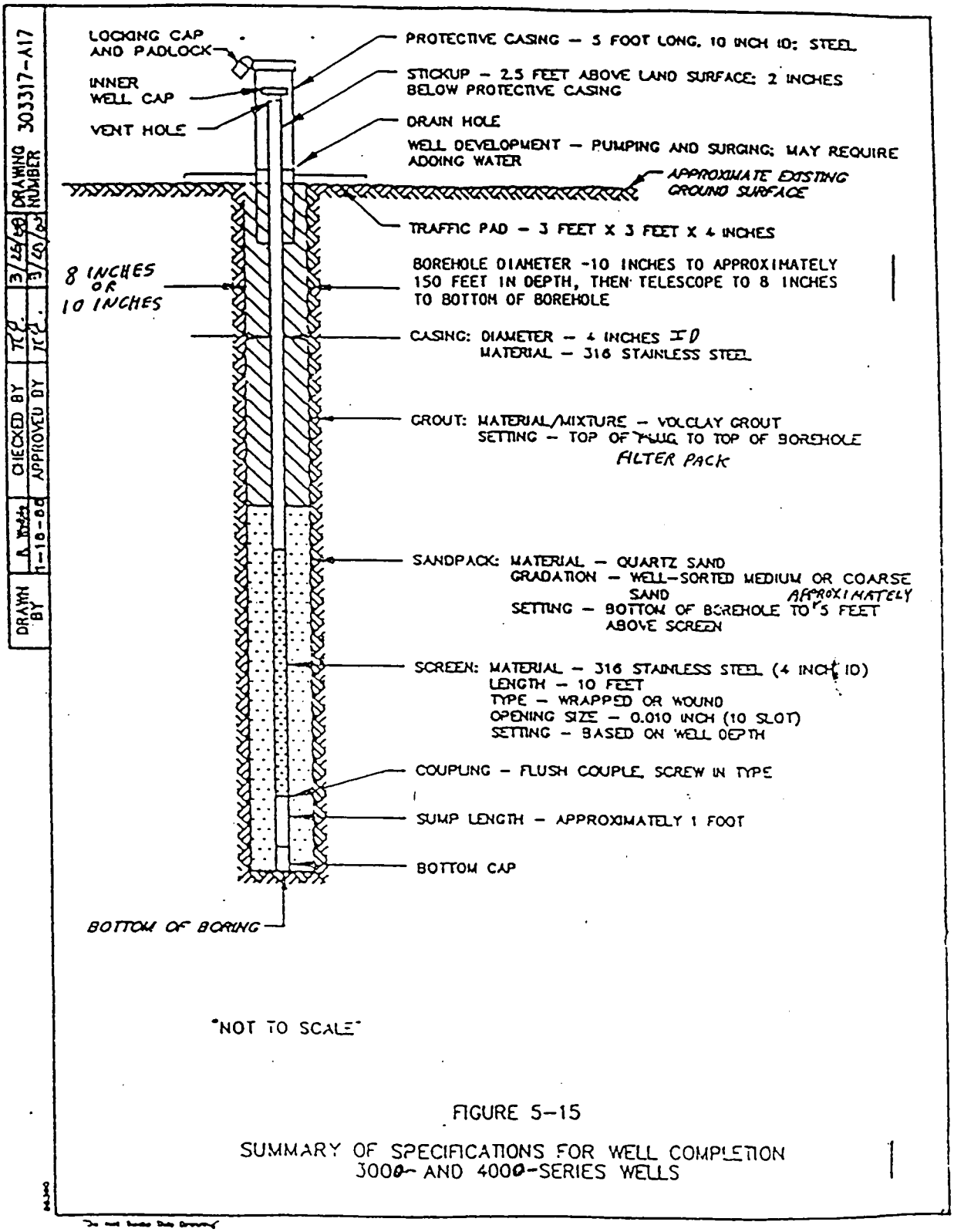

FIGURE 5-15

SUMMARY OF SPECIFICATIONS FOR WELL COMPLETION
3000- AND 4000-SERIES WELLS

JUSTIFICATION FOR THE USE OF EIGHT-INCH DIAMETER TEMPORARY CASING IN RI/FS MONITOR WELLS
June 28, 1990

- **At present < 400 feet of reliable 10-inch casing is available**
- **Problems with threads and collar failure of 10-inch casing**
- **Casing for cable-tool applications not readily available**
- **Materials to "make up" new 10-inch have been obtained**
- **New 10-inch to be on location within the next month**
- **8-inch presently approved for telescoping in 4000 series monitor wells**
- **Substitution of 8-inch will allow continued full utilizaton of drilling crews on-site**

1431

Department of Energy
FMPC Site Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6319

AUG 10 1990
DOE-1630-90

Mr. John D. Wood, Project Director
Advanced Sciences, Inc.
11003 Hamilton-Cleves Road
P. O. Box 475
Ross, OH 45061

Dear Mr. Wood,

OEPA APPROVAL OF DCR #45

Enclosed you will find written OEPA approval for DCR #45. This approval has previously been faxed to you. We have yet to receive similar written approval from the U. S. EPA.

If you have any questions, please contact Oba Vincent, at (513) 738-6937.

Sincerely,

Bobby Davis
Contracting Officer's
Representative

DP-84:Vincent

Enclosure: As stated

cc w/encl.:

H. E. Richardson, WMCO

RECEIVED
AUG 10 90
FEMP

FILE
2.2.1.3
7.1.3.2

78

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
40 South Main Street
Dayton, Ohio 45402-2086
(513) 285-6357
FAX (513) 285-6249

Original File Copy

1431 fax to John Hood

Richard F. Celeste
Governor

July 26, 1990

Re: DOCUMENT CHANGE
REQUEST #45

Mr. Bobby Davis
DOE-FMPC
P.O. Box 398705
Cincinnati, Ohio 45239

Dear Mr. Davis:

This letter provides written approval of Document Change Request #45 regarding the use of eight inch temporary casing in RI/FS monitor wells. Verbal approval of this request was given at the TIE meeting on June 28, 1990

Sincerely,

Graham Mitchell
Project Coordinator

GM/acp

cc: Catherine McCord/USEPA Region 5

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
40 South Main Street
Dayton, Ohio 45402-2086
(513) 285-6357
FAX (513) 285-6249

Original File Copy

1431 fax to Johnicek

Richard F. Celeste
Governor

July 26, 1990

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P.O. Box 398705
Cincinnati, Ohio 45239

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Sincerely,

Graham Mitchell
Project Coordinator

GM/acp

cc: Catherine McCord/USEPA Region 5

DOCUMENT CHANGE REQUEST

This form is used to initiate permanent changes to controlled distribution project-specific procedures, such as the QAPP, Work Plan, and Sampling Plan.

REQUEST NO. 49
Issue Date: 7-12-90
Page 1 of 2
Do Not Write In This Block

REQUESTOR: J. F. Poliziani JFP 7-12-90 PHONE NO.: 738-3100 DATE: 5-14-90

DOCUMENT TITLE: Quality Assurance Project Plan

SECTION/PARAGRAPH/PAGE NO.: 8.0 Table 8-3 11 of 12 DOCUMENT NUMBER: Volume V

ISSUE DATE: April 1990 LATEST REVISION DATE: March 1988

JUSTIFICATION: Please revise table 8-3, page 11 of 12 Section 8.0 Volume V (QAPP) schedule of calibration of radiological equipment. ANSI N-323-1978 requires annual calibration and manufactures' Ludlum and Eberline identify annual calibrations. Revising the calibration schedules will allow increased availability of equipment and reduce calibration costs.

CONTENT OF CHANGE: Revise table 8-3, page 11 of 12 Section 8.0 Volume V Schedule of Calibration for Ludlum Model 19, micro meter; Ludlum Model 12, Portable Survey Meters; Eberline BC-4, Beta Counter; Eberline SAC-4, Scintillation Alpha Counter to 6 month intervals. See attached mark up.

EFFECTIVE DATE OF CHANGE:

☐ When all approvals have been obtained: _____ Effective Date

☐ Other (Specify): _____

REQUIRED APPROVALS:

Project Director	7/16/90 Date		
Project QA Officer	7-12-90 Date	WMCO QA Officer	7/12/90 Date
Technical Manager	7/16/90 Date	DOE COTR	7/24/90 Date

TO BE COMPLETED BY DOE

A. Prior EPA notification required?	☐ Yes	☑ No
B. Prior EPA approval required?	☐ Yes	☑ No
C. Immediate implementation?	☑ Yes	☐ No

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TABLE 8-3
(Continued)

INSTRUMENT/EQUIPMENT	MANUFACTURER	CALIBRATION REFERENCE	CALIBRATION FREQUENCY
Ludlum Model 19 Micro R Meter	Per Section 5 Ludlum Instruction Manual	Ludlum Model 19 Micro R Meter Instruction Manual	~~Once/3 months~~(b) 6 month
Ludlum Model 12 Portable Survey Meter with 44-9 Pancake GM detector or 43-5 alpha scintillation detector	Per Section 5 Ludlum Instruction Manual	Ludlum Model 12 Survey Meter Instruction Manual	~~Once/3 months~~(b) 6 months ~~Daily~~
Eberline BC-4 Beta Counter	Known Beta-Gamma Source, Section IV-D of Instruction Manual	Eberline BC-4 Beta Counter Instruction Manual	~~Daily or before each use~~(b) 6 months
Eberline SAC-4 Scintillation Alpha Counter	Known Alpha Source Section IV-D of Instruction Manual	Eberline SAC-4 Scintillation Alpha Counter Instruction Manual	~~Daily or before each use~~(b) 6 months

(a)Each day samples are analyzed.
(b)Operational check before each use.